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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,859	08/21/2003	Hiroyuki Kakiuchi	241676US0XCONT	6303
22850 7590 11/21/2007 OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER JIANG, CHEN WEN	
			ART UNIT	PAPER NUMBER
			3744	
			NOTIFICATION DATE	DELIVERY MODE
			11/21/2007	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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## Office Action Summary

Application No.

10/644,859

Applicant(s)

KAKIUCHI ET AL.

Examiner

Chen-Wen Jiang

Art Unit

3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 September 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21 and 41-88 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12-19, 53-60, 66-68 and 78-80 is/are allowed.
- 6) ☒ Claim(s) 1-11, 20, 21, 41-52, 61-65, 69-77 and 81-88 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 20070801.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Response to Arguments*

1. The amendments and arguments presented by the applicant have been duly noted. However, an update search and further review of the prior art of record has prompted the presentation of new rejections presented below. In view of such, the previous rejections in the first office action have been withdrawn.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
3. Claims 1,4,5,6,9,20,41,42,45,46,47,50,61,63-65,69-71,75-77 and 81-83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiroyuki et al. (JP 11-223411) in view of Komarneni et al. (AW IDS filed 12/19/2006).

In regard to claims 1,4,9,20,41,42,45,50,61,63-65,69-71,75-77 and 81-83, Hiroyuki et al. disclose the invention substantially as claimed. Hiroyuki et al. disclose a heat pump system for

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vehicle as shown in Fig.4, the system comprises adsorption heat pump 1, reaction containers 11,12 filled with adsorbent, condenser 14, evaporator 13, pressure machine 10 and bypass valve 29. However, Hiroyuki et al. do not disclose claimed adsorbent material. Komarneni et al. disclose a high performance nanocomposite desiccation materials. The dry agent comprise a zeolite (adsorption/desorption) for gas thermal vaporization and cooling systems (heat pump) (p.18). It is described that water adsorption/desorption amount was measured at 25<sup>0</sup>C (p.19, line 4). Table 1 discloses the dry agent zeolite comprises aluminum, phosphorus and heteroatom. The water absorption amount of SAPO-17 is 0.306 g/g when a relative vapor pressure ( $P/P_0$ ) = 0.9 (p.20, Table 1); and the adsorption amount change of SAPO-17 when a relative vapor pressure is changed by 0.15 in the relative vapor pressure range of 0.05 to 0.30, which is obtained based on the adsorption isotherm, is about 0.20 g/g (p.33, Fig. 15b). Therefore, SAPO-17 (CHA term) disclosed in Komarneni et al. is the adsorbent that satisfies the condition of the constituent features. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Hiroyuki et al. using SAPO-17 in view of Komarneni et al. to perform heat pump operation since SAPO-17 is a known adsorbent material. In regard to the additional decompression device in the apparatus of Hiroyuki et al. as asserted by the Applicant, Fig.4 has bypass valve 29. The valve 29 is used when there is no need to pass the adsorbent through compression/decompression device 10 as described in Hiroyuki et al. Therefore, the Applicant's apparatus is equivalent to Hiroyuki et al.'s apparatus when the device 10 is turned off. Furthermore, without decompression is not in the claim.

In regard to claims 5,6,46 and 47, the species of SAPO-17 is disclosed by Komarneni et al., the gel of  $\text{ICHA}:0.1\text{SiO}_2:\text{Al}_2\text{O}_3:\text{P}_2\text{O}_5:50\text{H}_2\text{O}$  is disclosed as a specific example of the

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composition. In the composition of Table 1: an atomic ratio of Si:Al:P is 0.1:2:2; a molar ratio X of the heteroatom (Si) is  $0.1/4.1 = 0.0243$ ; and each of molar ratios of y (Al atom) and z (P) is  $2/4.1 = 0.488$ , which overlap with the claimed range (p18, lines 1-4).

4. Claims 2,3,7-11,21,43,44,48-52,62,72-74 and 84-88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiroyuki et al. (JP 11-223411) in view of Komarneni et al. (AW IDS filed 12/19/2006) and further in view of Mizota et al. (JP 2001-239156).

In regard to claims 2,9,10,43,50,51 and 88, Meier et al. disclose that the framework density of SAPO-37 is  $12.7 \text{ T/1,000\AA}^3$  (p.104) and this range overlaps with the claimed range and used for heat pump as described in the disclosure. Table 1 of Komarneni et al. presents several type of CHA descriptions and gel compositions.

In regard to claims 3 and 44, Mizota et al. disclose the preferred mean particle diameter of 0.1-20 micrometers.

In regard to claims 7,48 and 87, Meier et al. disclose the intensity area ratio as showing at the end the reference as marked of (within the Meier et al.).

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2002-175356

[受付日]平成18.05.30

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3]

参考資料 1

【添付書類】

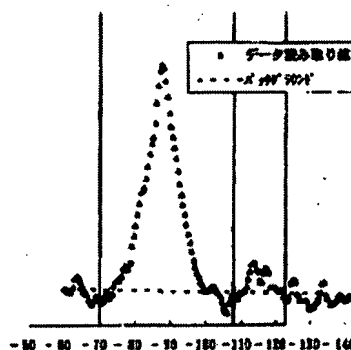
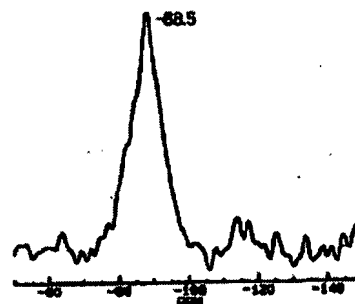
!  061

【物件名】

参考資料 1

か焼および再水化したSAPO-17サンプルの $^{29}\text{Si}$ -NMRのプロファイルを市販の計算ソフトにデジタルデータとして取り込み（下図参照）、請求項1に関連する信号強度の積分強度面積比を求めたところ下のようになります。

$$\frac{(-108 \text{ ppm} \sim -123 \text{ ppm} \text{ の信号強度の積分強度面積})}{(-70 \text{ ppm} \sim -123 \text{ ppm} \text{ の信号強度の積分強度面積})} = 6 \%$$



1

In regard to claims 8,21,49,62,72-74 and 84-86, Meier et al. disclose the intensity area ratio as showing at the end the reference as marked as (within the Meier et al.).

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[特許] 2002-175356

[受付日] 平成18.05.30

1/E

【物件名】

参考資料 2

【添付書類】

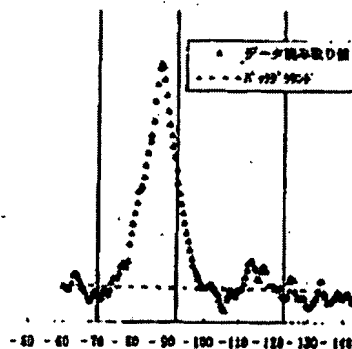
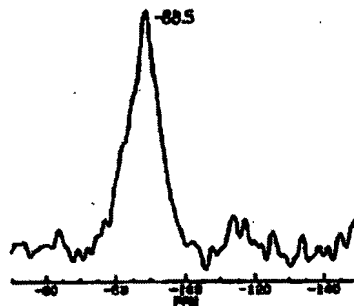
1. 069

【物件名】

参考資料 2

か焼および閉水化したSAPO-17サンプルの $^{29}\text{Si}$ -NMRのプロファイルを用いた解析ソフトにデジタルデータとして取り込み（下記参照）、請求項2に関連する信号強度の積分強度面積比を求めたところ下のようになります。

$$\frac{(-70 \text{ ppm} \sim -92 \text{ ppm} \text{ の信号強度の積分強度面積})}{(-70 \text{ ppm} \sim -123 \text{ ppm} \text{ の信号強度の積分強度面積})} = 82\%$$



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In regard to claims 11 and 52, Meier et al. disclose the adsorption amount at a relative vapor pressure of 0.05 is 0.03g/g (within the Meier et al.).

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日2002-175856

[受付日]平成18.05.30

1/8

氏名]

参考資料 4

【添付書類】

1 069

【物件名】

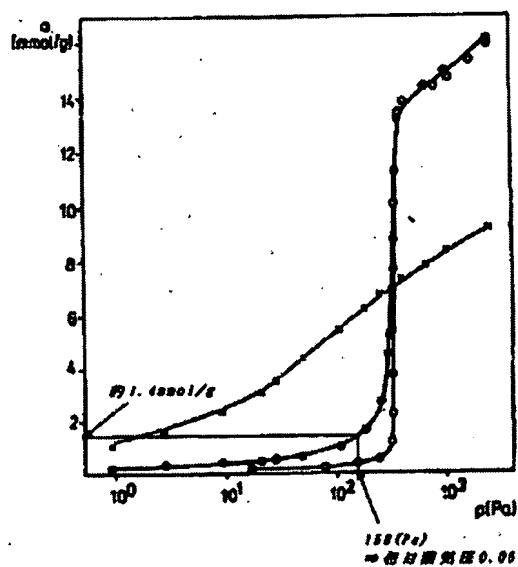
参考資料 4

下図に示すSAPO-17の吸着等温線(298K)から、相対湿度0.05 ( $\Rightarrow 3167 \text{ Pa} \times 0.05 = 158 \text{ Pa}$ ; 3167 Paは298Kでの飽和蒸気圧)の吸着量は、下式のように約0.03 g/gとなります。

約1.4 mmol/g

ここで、水の分子量は18.0だがら、

約1.4 mmol/g / 1000 × 18.0 = 約0.03 g/g



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### Double Patenting

5. Claims 1-11,20,21,41-52,61-65,69-77 and 81-88 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-25 of copending Application No. 11/235,704. Although the conflicting claims are not identical, they



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are not patentably distinct from each other because claims 1-25 of copending Application No. 11/235,704 includes the all limitations of independent claims 1,20,21,42,61 and 62 of this application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

***Allowable Subject Matter***

6. Claims 12-19,53-60,66-68 and 78-80 are allowed.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chen-Wen Jiang whose telephone number is (571) 272-4809. The examiner can normally be reached on Monday-Thursday from 8:00 to 6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571) 272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Chen-Wen Jiang  
Primary Examiner

